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## Voxengo GlissEQ User Guide



Version 3.9

<http://www.voxengo.com/product/glisseq/>

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## Introduction

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GlissEQ is a parametric equalizer plug-in for professional music production applications. The most interesting and unique feature of GlissEQ is the dynamic behavior of its filters.

To understand dynamic filtering, let's begin by re-stating something probably obvious about a normal equalizer: you always get what you set. In other words, when you specify a 6 dB boost at 100 Hz you get exactly 6 dB of boost at 100 Hz.

But GlissEQ is different. When you specify a 6 dB boost at 100 Hz, you don't necessarily get a 6 dB increase in gain. Instead, the filter's effective gain is adjusted dynamically according to the program material. That is what we mean by dynamic filtering and it is the key to GlissEQ.

You should notice these immediate benefits: boosting highs with GlissEQ tends to avoid the fatiguing effect of overload. And boosting lows avoids making things sound mushy. Instead, you get a pleasant emphasis of transients, bringing life and dimension to your tracks. In short, the "dynamic behavior" of GlissEQ's filters gives you a helping-hand during mixing and mastering.

In addition to dynamic filtering, GlissEQ also features a real-time spectrum analyzer. The spectrum of a track can be exported to any other instance of GlissEQ thus making real-time inter-track spectrum comparisons possible. This helps you free frequency ranges on one track to allow an instrument on another track occupying same frequencies to breathe.

## Features

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- Dynamic filters
- Real-time spectrum analysis
- Real-time spectrum import/export
- Up to 32 parametric filter bands
- 18 filter types
- Harmonically-enhanced filter type
- Narrow-band sweeping
- EQ area highlight
- Static spectrums display
- User interface window resizing
- Stereo and multi-channel processing
- Internal channel routing
- Channel grouping
- Mid/side processing
- Up to 8x oversampling
- 64-bit floating point processing
- Preset manager
- Undo/redo history
- A/B comparisons
- Contextual hint messages
- All sample rates support

- Zero processing latency

## Compatibility

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This audio plug-in can be loaded into any audio host application that conforms to the AAX, AudioUnit, VST or VST3 plug-in specification.

This plug-in is compatible with Windows (32- and 64-bit Windows XP, Vista, 7, 8, 10 and later versions) and Mac OS X (10.6 and later versions, 32- and 64-bit, Intel processor-based) computers (2 GHz dual-core or faster processor with at least 2 GB of system RAM required). A separate binary distribution file is available for each target computer platform for each audio plug-in specification.

## User Interface Elements

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**Note:** All Voxengo plug-ins feature a highly consistent user interface. Most interface elements (buttons, labels) located on the top and bottom of the user interface are the same in all Voxengo plug-ins. For an in-depth description of these and other standard features and user interface elements please refer to the “Voxengo Primary User Guide”.

### Equalizer

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This panel displays the parametric equalizer’s control surface.

**Note:** Please refer to the “Voxengo Primary User Guide” for in-depth information about this control surface’s functions. GlissEQ features important enhancements over the standard functionality.

The control points represent the frequencies you are going to filter.

#### Insert a control point

Double-click the control surface anywhere. The filter type is set automatically depending on the frequency position this point was added at: the “low-shelf” filter type is set on frequencies below 100 Hz, the “high-shelf” filter type is set on frequencies above 7 kHz, the “peaking” filter type is set on all other frequencies).

#### Enable/Disable a control point

Double-clicking on an existing control point. A disabled control point is automatically re-enabled whenever you move it.

#### Delete a control point

Select the control point, then right mouse click and choose the “Remove filter” option.

**Note:** The numbers on the control points correspond to the host automation parameters, their on-screen position (ordering) does not affect the sound of the equalizer.

#### Range Selector

The “Range” selector allows you to set the accessible EQ gain range, which you think is most suitable for the sound material you are working with.

#### “Underlay” Selector

The “Underlay” selector allows you to add an additional underlying EQ curve and spectrum (in a specified color) from another channel group of the current plug-in instance.

#### “Dyn” Selector

The “Dyn” selector specifies dynamic behavior mode of the filter types that use the “Dyn” parameter which was set above 0%:

- The “Normal” mode offers a normal dynamic behavior offering a moderate amount and swiftness of gain swing.
- The “Instant” mode features a quicker and deeper gain swing which usually creates a “dirtier”, “busy” sound. This mode may produce an audible warble on EQ cuts.
- The “Relaxed” mode produces a controllable “round” sound with a slow gain swing, but with a bit swishy sound.

**Important Note:** The “Dyn” parameter is the real key to GlissEQ because it controls how pronounced the dynamic filtering effect will be. The “Dyn” parameter adds a whole new dimension to the equalizer as you know it!

### “Static” Button

The “Static” button opens the “Static Spectrums Editor” window. For in-depth information, please refer to the “Voxengo Primary User Guide”.

### “Areas” Selector

This selector allows you to highlight areas of the spectrum display. Press the “Edit” button to define your own areas.

## Filter Types

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GlissEQ features the following filter types:

### Peaking

A parametric filter with dynamic behavior.

### Peaking Inv

Essentially the opposite of the “Peaking” filter. While the normal (non-inversed) dynamic behavior usually emphasizes transients, the inversed behavior emphasizes the sustain portion of a sound’s envelope.

### Peaking Hrm

A parametric filter with dynamic behavior and a non-linear operation which produces moderate harmonic distortion. This can be useful to add “body” to sterile-sounding tracks. Harmonic content is mainly added on frequency boosts. Cuts tend to produce smaller amounts of harmonic enhancement.

### Peaking Plain

A parametric filter without dynamic behavior. Designed for efficient (CPU load-wise) processing. This filter is not affected by the “Dyn Mode” setting.

### Lo-shelf/Hi-shelf

Low-shelving and high-shelving filters with dynamic behavior.

### Lo-pass 6/Hi-pass 6, Lo-pass 12/Hi-pass 12, Lo-pass 24/ Hi-pass 24

Non-dynamic low-pass and high-pass filters with the specified slope in decibels per octave. The bandwidth parameter affects the transition band of these filters. The filter’s slope is fixed. For example, you can't use the bandwidth parameter to turn the 24 dB/oct filter into the 48 dB/oct one – you have to use two 24 dB/oct filters to get

the 48 dB/oct slope. The optimal bandwidth for these filters is around 1.9 – it provides minimal transition band without resonance boost appearing.

### Notch-Band Rejection Filter

Filters out a narrow spectral area completely (minus infinity gain at center frequency).

### Notch 4, Notch 8

A battery of “Notch” filters, with each filter spaced at 2x, 3x, 4x, etc. distance from the center frequency. Can be useful for removing power line “buzz” around 50-60 Hz.

### Peaking 4, Peaking 8

A battery of “Peaking” filters, similar to “Notch” filter batteries.

### Bandpass

A standard band-pass filter. Usually used for “telephone line” sound effects. This filter can be also used for monitoring of a narrow spectral band.

**Note:** The dynamic activity of the currently selected filter is displayed by means of a dark red EQ curve that reflects the dynamic gain level changes of the filter.

## Selected Filter

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This panel allows you to precisely adjust parameters of a single selected filter. Before this panel can be used, you should select a control point in the “Equalizer” panel, or use the provided scrolling buttons to select the required filter.

### “Type” Selector

Selects the type of filter. Right-click to temporarily disable the filter. A second right-click will return the selector to its initial filter type selection.

### “Freq” Parameter

Selects the center (or corner) frequency of the filter in Hertz. Note that the specified frequency may extend the visual display range. The displayed frequency range can be adjusted in the “Spectrum Mode Editor” window.

### “B/W” Parameter

Selects “bandwidth” of the filter (in octaves). This parameter has a different meaning for each filter type.

### “Gain” Parameter

Adjusts the peak gain of the filter (in decibels.)

### “Dyn” Parameter

Specifies the strength of dynamic behavior (in percent). Values near 0 effectively disable the dynamic behavior of the filter.

**Note:** The default parameter values (bandwidth, etc.) are assigned to the filter whenever you add a new control point. This default value can also be specified by first setting the desired values for control point “1” in the first channel group and then using the “Set as Default” preset manager function.

You can double-click a parameter knob at any time to reset it. Otherwise, parameters in all newly added filters will be set to the factory defaults.

## Spectrum

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### “Export To” Selector

Specifies the destination slot where the real-time spectrum of the current channel group should be exported to. If you do not plan to import this real-time spectrum in other GlissEQ plug-in instances we suggested you leave the “Export To” setting at “---” (off) so that this feature does not tax the CPU.

When using the export function it is suggested that you give a distinctive name to plug-in’s instance (e.g. “Bass Guitar”, “Vocals”, “Drums”) so that this name is recognizable in the “Import From” lists within other GlissEQ instances.

For example, if you would like to see spectrums of “bass” and “drums” tracks together with the “vocals” track, you have to put GlissEQ plug-in instance to each of these tracks. Then set the “Export To” values in the plug-in instances on the “bass” and “drums” tracks, and set two “Import From” selectors in the plug-in instance on the “vocals” track.

Note that you need to avoid situations where any two instances of the plug-in use the same “Export To” slot: this situation can happen if you load a preset or copy plug-in’s instance with a predefined “Export To” value; the “Export To” selector itself will not allow you to select non-vacant slots. While such situation is not critical, it will produce uncertain results (unexpected imported spectrum and coloration).

### “Mode” Selector

Allows you to select and edit spectrum’s display mode. Please refer to the “Voxengo Primary User Guide” (the topic called “Standard Controls – Spectrum Mode Editor”) for in-depth information about spectrum mode settings.

### “Import From” Selectors

Allows you to import real-time spectrums from other GlissEQ instances. If no plug-in instances are exporting their spectrums the “Import From” list will be empty. Imported spectrum’s color will be the same as selected in the exporting plug-in’s instance.



**Note:** The imported spectrum’s resolution and type (average, maximum, etc.) solely depends on the spectrum mode selected in the plug-in instance that exported this spectrum.

“Hold” Switches

These switches allow you to hold spectrum updates temporarily for the purpose of visual comparison.

**Note:** Spectrum updates will be automatically resumed whenever you switch between channel groups.

EQ Areas



This window allows you to define your own highlight areas on the spectrum display. Highlighted areas can be used as helpers to remind you of the signal types present in specific frequency ranges.

You may define up to 32 areas. Each defined area can be deleted or hidden. You can define area’s name, color, frequency range, vertical position and height.

These areas can be saved to and loaded from a text “CSV” file.

You can use a tool presented here: <http://blog.airmann.de/scalefreq-generator-v1-0/> to create visualization of various notes / musical scales in GlissEQ format.

Load CSV/Save CSV

These functions allow you to load and save the currently visible EQ curve to a text file, readable by spreadsheet software. The EQ curve is stored as a series of “frequency, gain, bandwidth, dyn, filter type” set of values, one per line, in the following form:

```
31.00,0.00,2.500,100.0,Off
152.71,-8.28,0.560,100.0,Peaking Hrm # comment
545.77,7.37,2.500,150.0,Peaking
2102.66,-6.37,2.500,100.0,Peaking
7609.41,-4.22,2.500,100.0,Hi-shelf
```

Each set of values defines position of a single control point on GlissEQ’s control surface. Note that decimal point should be written as a period, not a comma. Comments can be written in any position of the file, starting with a hash character.

The “Load CSV” function permits you to load a previously saved CSV file or any externally-generated EQ curve specification. Note that the file can also contain partial information (e.g. excluding “dyn” and “filter type” values):

```
31.00,0.00,2.500  
152.71,-8.28,0.560  
545.77,7.37,2.500
```

## Wide View Mode

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When this mode is enabled, equalizer’s control surface becomes wider, but the knobs, spectrum import/export and meter panels become hidden.

To adjust filter’s “dyn” parameter in this mode hold down the “Ctrl” (“Command” on Mac OS X) button while dragging the control point with the left and right buttons simultaneously (We refer to this as “bandwidth adjustment” mode.)

## Some Background On Dynamic Filtering

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This topic provides you additional information about the dynamic behavior of GlissEQ's filters.

First of all, it is important to understand that the dynamic behavior of GlissEQ's filters does not depend on the absolute loudness level of the signal being processed. Even if you apply an overall gain change to the sound before applying GlissEQ the sound will not change: the dynamic behavior is level-independent.

Secondly, this dynamic behavior does not depend on whether you are using boost or cut filters: in both cases the dynamic behavior will be taking place.

As was already noted in the introduction, the actual filter's gain depends on the material you are filtering. For example, if you have set +6 dB dynamic peaking filter at 5kHz and the signal you are filtering has a lot of energy in that same 5kHz frequency band, the filter's actual gain will be lower – it may reach only +3 dB at 100% “Dyn” setting.

The same concept applies to cutting filters symmetrically: a -6 dB peaking filter will not reach that amount of gain reduction if the frequency band you are filtering contains a lot of energy. So when using “cuts” if there is a lot of energy in a particular frequency, you should consider using the “Peaking Inv” filter type if you want the filter to reach full gain reduction.

The main benefit this dynamic behavior offers is transient emphasis. Since the filter's gain change is slightly delayed relative to changes in the signal's loudness, this delay automatically produces an emphasis in transients. In other words, the filter does not “see” the front edge (attack) of the sound, but rather the body (sustain) of the sound. And remember that this works for all frequencies. However, since high-frequency events are usually shorter in duration (e.g. high hat hits), the dynamic swing of the filter tuned to boost or cut higher frequencies will be small. On the other hand, when a prolonged event happens (such as with a crash cymbal hit) the filter's gain change will be stronger. So while boosting a frequency works to emphasize transients, cutting a frequency works more to suppress transients within that frequency's region. And this automatically increases the relative dynamic range of the unaffected frequencies.

Generally speaking, the filter's gain change depends on the ratio of signal power between the input (before the filter) and the output (after the filter.) This means that filters with a high user-specified gain setting naturally exhibit a higher dynamic swing. You can use this fact to assist you a great deal during equalizing because when using small (e.g. 2-3 decibel) gain changes, the dynamic behavior will be minimal unless the “Dyn” parameter is increased.

## Credits

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DSP algorithms and internal signal routing code were created by Aleksey Vaneev.

Graphics user interface code and the “standard” graphics design were created by Vladimir Stolypko.

This plug-in is implemented in multi-platform C++ code form and uses “zlib” compression library (written by Jean-loup Gailly and Mark Adler), LibLZF by Marc Alexander Lehmann, filter design equations by Magnus Jonsson and Robert Bristow-Johnson, VST plug-in technology by Steinberg, AudioUnit plug-in SDK by Apple, Inc., AAX plug-in SDK by Avid Technology, Inc., Intel IPP and run-time library by Intel Corporation (used under the corresponding licenses granted by these parties).

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### Beta-Testers

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## Questions and Answers

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**Q. Would you recommend the GlissEQ for mastering? Or is it more suited for single track usage?**

A. GlissEQ can be used for both in-track and mastering processing. However, at the mastering stage we suggest using lower Dyn parameter values (below 100%) to reduce any possible excessive filter gain swinging.

**Q. Can you explain the differences and definitions of “Shelving”, “Peaking” and “Band-pass” filters?**

A. “Shelving” is a filter that looks like a shelf (or a stairway step.) A “Peaking” filter has a single peak and looks like a bell shape. A “Band-pass” filter passes a single selected frequency band only (width of this band is adjustable) – the passed frequency band looks like a cone.

**Q. Would a “High-shelf” filter, mute or expose the highs?**

A. It can do both. “High-shelf” adjusts the higher frequencies (above the center frequency.) On the EQ curve window this filter looks like a stairway step up or down.

**Q. Does GlissEQ use some kind of compression?**

A. No! Although, at first they may seem similar, the dynamic behavior of GlissEQ’s filters is not the same because it is level-independent.

**Q. I want to monitor the output of this plug-in on the spectrum analyzer.**

A. GlissEQ always shows the output signal’s spectrum after all defined filters are applied. So, you will always see the effect of the equalizer.

**Q. I have a loud input signal and the spectrum analyzer plot frequently goes off-screen. How can I overcome this inconvenience?**

A. In this situation, open the “Spectrum Mode Editor” window and adjust the “Range Low” and “Range High” parameters to achieve a better visual fit.

**Q. I'm trying to understand the “spectrum export/import” capability in GlissEQ. For example, if I want to carve out a separate space in the mix for a vocal and guitar track, could I put GlissEQ on that track and be able to see which frequencies are fighting one another?**

A. Exactly. The “spectrum export/import” function was designed to be used for just such purposes. You may see the overlapping frequencies present in both vocal and guitar. You can then simply reduce these frequencies in the portions of the track where they are less important.

**Q. On your web site I saw a screenshot with 3 differently-colored spectrums shown. I can only manage to see one on my setup. What is the “trick” to see all of them?**

**A.** To be able to see (import) another spectrum, insert an additional GlissEQ instance on another audio channel in the same project. In that additional GlissEQ instance set the “Export To” selector to any available slot. Then you can import data from this slot into any other GlissEQ instance via the “Import From” selectors.

**Q. Is GlissEQ somehow different from CurveEQ?**

**A.** GlissEQ differs vastly from CurveEQ. GlissEQ is an analog-style (minimum-phase) equalizer, with zero latency processing. CurveEQ is a linear-phase equalizer and has considerable processing latency. GlissEQ’s filters also feature dynamic behavior which CurveEQ’s filters do not.

**Q. Isn't it true that when filtering the lower frequencies one should use linear-phase filters?**

**A.** When equalizing musical signals, there is no hard rules for choosing between linear-phase and minimum-phase (analog) filters. This is mainly a question of taste. When using GlissEQ to equalize the lower frequencies you may want to try using softer EQ shapes. Steep EQ curves may sound a bit “boxy” due to a higher “group delay” produced by such curves.

**Q. Why does the “Peaking Inv” filter not working as a normal peaking filter like all the other peaking filters at Dyn=0?**

**A.** The “Peaking Inv” filter works the opposite of the “Peaking” filter. That is why at Dyn=0 it always stays at “full off”. So this is the correct behavior.

**Happy Mixing!**